

We claim:

1. A method of predicting the progression of osteoarthritis or other types of arthritis involving joint destruction, comprising determining a ratio of C1, 2C neoepitope to C2C neoepitope, wherein a higher result of said ratio is predictive of a greater progression of joint destruction of the arthritis.

2. The method according to claim 1, wherein a higher result of said ratio is predictive of a greater progression of osteoarthritis.

3. The method according to claim 1, wherein said osteoarthritis is knee osteoarthritis.

4. A method of predicting the progression of rheumatoid arthritis or other types of arthritis involving joint destruction, comprising determining a ratio of C1, 2C neoepitope to C2C neoepitope, wherein a lower result of said ratio ratio is predictive of a greater progression of rheumatoid arthritis.

5. The method according to claims 1 or 4, wherein said subject does not exhibit generalized osteoarthritis or exhibits rheumatoid or other inflammatory erosive arthritis.

6. A method of predicting the progression of arthritis involving joint destruction other than osteoarthritis, comprising determining a level of C2C neoepitope and/or C1, 2C neoepitope in a subject, wherein a lower result of said level is predictive of a greater progression of joint destruction of the arthritis.

7. The method according to claim 6, wherein a lower result in C2C neoepitope and/or C1, 2C neoepitope level is predictive of a greater progression of rheumatoid arthritis.

8. A method of monitoring osteoarthritis, rheumatoid arthritis, or other types of arthritis involving joint destruction, comprising determining a ratio of C1, 2C neoepitope to C2C neoepitope in a subject, wherein an increase or change in said ratio

indicates an increase or change in rate of progression of joint destruction of the arthritis.

9. The method according to claim 8, wherein an increase in the ratio indicates a progression of osteoarthritis.

10. The method according to claim 8, wherein a decrease in the ratio indicates a progression of rheumatoid arthritis.

11. The method according to claim 1, wherein the subject does not exhibit generalized osteoarthritis or exhibits rheumatoid arthritis or other inflammatory erosive arthritis.

12. The method according to claim 1, wherein said osteoarthritis is knee osteoarthritis.

13. A method of monitoring arthritis involving joint destruction other than osteoarthritis, comprising determining a level of C2C neoepitope and/or C1, 2C neoepitope in a subject, wherein a change in said level indicates a change in rate of progression of joint destruction of the arthritis.

14. The method according to claim 13, wherein a decrease in C2C neoepitope and/or C1, 2C neoepitope level indicates an increase in rate of progression of rheumatoid arthritis.

15. A method of monitoring efficacy of a therapeutic treatment for osteoarthritis, rheumatoid arthritis or other types of arthritis involving joint destruction, comprising determining a ratio of C1,2C neoepitope to C2C neoepitope in a subject, wherein a decrease or change in the ratio indicates or relates to a decrease or change in the rate of progression of joint destruction of the arthritis.

16. The method according to claim 15, wherein the subject does not exhibit generalized osteoarthritis or exhibits rheumatoid arthritis or other types of arthritis involving joint destruction.

17. The method according to claim 15, wherein an increase in said ratio indicates a progression of osteoarthritis.

18. The method according to claim 15, wherein a decrease in said ratio indicates a progression of rheumatoid arthritis.

19. The method according to claim 15, wherein said osteoarthritis is knee osteoarthritis.

20. A method of monitoring efficacy of a therapeutic treatment for arthritis involving joint destruction other than osteoarthritis, comprising determining a level of C2C neoepitope and/or C1, 2C neoepitope in a subject, wherein a change in the level indicates or relates to a change in the rate of progression of joint destruction of the arthritis.

21. The method according to claim 20, wherein a decrease in C2C neoepitope and/or C1, 2C neoepitope level indicates an increase in rate of progression of rheumatoid arthritis.

22. A method of identifying an agent for treating osteoarthritis, rheumatoid arthritis or other types of arthritis involving joint destruction, comprising administering to a subject an agent to be tested, and determining a ratio of C1,2C neoepitope to C2C neoepitope in said subject, wherein a decrease or change in the ratio indicates or relates to a decrease or change in the rate of progression of joint destruction of the arthritis.

23. The method according to claim 22, wherein a decrease in said ratio indicates a decrease in the progression of osteoarthritis.

24. The method according to claim 22, wherein said osteoarthritis is knee osteoarthritis.

25. The method according to claim 22, wherein an increase in said ratio indicates a decrease in the progression of rheumatoid arthritis.

26. The method according to claim 22, wherein the subject does not exhibit generalized osteoarthritis, or exhibits rheumatoid arthritis or other types of arthritis involving joint destruction.

27. A method of identifying an agent for treating arthritis involving joint destruction other than osteoarthritis, comprising determining a level of C2C neoepitope and/or C1, 2C neoepitope in a subject, wherein a change in said level indicates a change in rate of progression of joint destruction of the arthritis.

28. The method according to claim 27, wherein a decrease in C1,2C neoepitope and/or C 2C neoepitope level indicates an increase in rate of progression of rheumatoid arthritis.

29. A pharmaceutical composition for osteoarthritis, rheumatoid arthritis or other types of arthritis involving joint destruction comprising an agent identified by the method of claims 22 or 27 in an amount effective to decrease or change the ratio of C1,2C neoepitope to C2C neoepitope in a subject or reduce or alter the amount of the increase or change in said ratio relative to an untreated subject.

30. The pharmaceutical composition according to claim 29, wherein an effective amount of said composition decreases said ratio, thereby slowing progression of osteoarthritis.

31. The pharmaceutical composition according to claim 29, wherein said osteoarthritis is knee osteoarthritis.

32. The pharmaceutical composition according to claim 29, wherein an effective amount of said composition increases said ratio, thereby slowing progression of rheumatoid arthritis.

33. The pharmaceutical composition according to claim 29, wherein said subject does not exhibit generalized osteoarthritis, or exhibits rheumatoid arthritis or other types of arthritis involving joint destruction.

34. A kit for for determining a ratio of C1,2C neoepitope to C 2C neoepitope in a biological sample, said kit comprising:

(a) a monoclonal antibody which binds to said C2C neoepitope having the following first peptide sequence

C-G-G-E-G-P-P(OH)-G-P-Q-G (COL2-3/4C_{long mono} peptide) ;

(b) a polyclonal or monoclonal antibody which binds to said C1, 2C neoepitope having the following second peptide sequence

C-G-P-P(OH)-G-P-Q-G (COL2-3/4C_{short} peptide)

(c) two solid supports for binding each of said first and second peptides;

(d) a first labelled antibody conjugated to a first enzyme to measure the binding of said monoclonal antibody to said first peptide containing the C2C neoepitope; and

(e) a second labelled antibody conjugated to a second enzyme to measure the binding of said polyclonal or monoclonal antibody to said second peptide containing the C1, 2C neoepitope.

35. The kit according to claim 34, wherein said biological sample is selected from the group consisting of synovial fluid, serum, plasma, urine, bronchoalveolar lavage, medium extracts and cartilage extracts.

36. The kit according to claim 34, wherein said biological sample is from a human, dog, bovine, horse, guinea pig, sheep, pig, rabbit, mouse or rat.

37. The kit according to claim 34, wherein said first and second enzymes are the same or different.

38. The kit according to claim 34, wherein said first or second enzyme is alkaline phosphatase or hydrogen peroxidase.

39. The kit according to claim 34, wherein an increase or change in said ratio indicates an increase or change in rate of progression of joint destruction of osteoarthritis.

40. The kit according to claim 34, wherein said osteoarthritis is knee osteoarthritis.

41. The kit according to claim 34, wherein a decrease or change in said ratio indicates an increase or change in rate of progression of joint destruction of rheumatoid arthritis.

42. The kit according to claim 34, wherein said biological fluid from a subject does not exhibit generalized osteoarthritis or exhibits rheumatoid arthritis or other types of arthritis involving joint destruction.

43. The kit according to claim 34, wherein wherein a higher result of said ratio is predictive of greater progression of joint destruction of osteoarthritis.

44. The kit according to claim 34, wherein wherein a lower result of said ratio is predictive of greater progression of rheumatoid arthritis.

45. In a method of treating osteoarthritis, rheumatoid arthritis or other types of arthritis involving joint destruction, the improvement comprising determining a ratio of C1,2C neoepitope to C2C neoepitope in a subject being treated, wherein a decrease or change in said ratio correlates to a decrease or change in rate of progression of joint destruction of the arthritis.

46. In the method according to claim 45, wherein a decrease in said ratio indicates a decrease in the progression of osteoarthritis.

47. In the method according to claim 45, wherein said osteoarthritis is knee osteoarthritis.

48. In the method according to claim 45, wherein an increase in said ratio correlates to a decrease in the progression of rheumatoid arthritis.

49. In the method according to claim 45, wherein said subject does not exhibit generalized osteoarthritis, or exhibits rheumatoid arthritis or other types of arthritis involving joint destruction.

50. In a method of treating arthritis involving joint destruction other than osteoarthritis, the improvement comprising determining a level of C2C neoepitope and/or C1, 2C neoepitope in a subject, wherein a change in the level indicates a change in rate of progression of joint destruction of the arthritis.

51. In said method according to claim 50, wherein an increase in C2C neoepitope and/or C1, 2C neoepitope level indicates a decrease in rate of progression of rheumatoid arthritis.